SPECIES RICHNESS AND HABITAT PREFERENCES OF HERPETOFAUNA IN GUNUNG HALIMUN NATIONAL PARK, WEST JAVA

[Kekayaan Jenis dan Preferensi Habitat Herpetofauna di Taman Nasional Gunung Halimun]

Hellen Kurniati

Museum Zoologicum Bogoriense, Research Center for Biology,
Widyasatwaloka Building-LIPI, Jalan Raya Cibinong Km 46,
Cibinong 16911, West Java.
Email: <hkurniati@yahoo.com>

ABSTRAK

Studi kekayaan jenis herpetofauna (amfibia dan reptilia) telah dilakukan di dalam dan sekitar Taman Nasional Gunung Halimun pada bulan September 2001-September 2002. Metode yang digunakan untuk mengetahui kekayaan jenis adalah dengan pengamatan langsung, penyinaran menggunakan Iampu senter, tangkap langsung dan perangkap lem pada semua habitat herpetofauna di sepuluh lokasi penelitian, yaitu Citalahab, Cibunar, Cianten, Cigadog, Gunung Wangun, Gunung Bedil, Gunung Botol, Legok Karang dan Cikeris. Dari kelompok amfibia didapatkan 25 jenis, sedangkan untuk reptilia 31 jenis; yang termasuk dalam lima suku kodok, empat suku reptilia kaki empat dan empat suku ular. Enam jenis endemik Jawa dijumpai, yaitu *Leptophryne cruentata, Microhyla achatina, Huia masonii, Nyctixalus margaritifer, Philautus vittiger, Rhacophorus javanus* dan *Spenomorphus puncticentralis.* Hasil dari penghitungan koefisien indeks kesamaan Jaccard memperlihatkan bahwa sepuluh lokasi survai terkelompok menjadi dua grup besar, yaitu grup hutan dan grup area terganggu. Tipe vegetasi, habitat dan ketinggian tempat merupakan faktor-faktor ekologi utama yang mempengaruhi penyebaran herpetofauna di Taman Nasional Gunung Halimun.

Key words: Amphibian, reptile, species richness, Gunung Halimun National Park.

INTRODUCTION

Approximately 33 native species of frogs are known from Java, of which there are nine endemic species (CI/CABS IUCN/SSC, 2002; Iskandar and Colijn, 2000). As well, there are approximately 29 lizard species (one endemics) (Iskandar and Colijn, in print), 99 snakes (three endemics) (Iskandar and Colijn, 2001) and ten species of non-marine turtles (Iskandar, 2000). Generally, the herpetofauna (amphibians and reptiles) of Java remains poorly studied; only certain areas have been studied comprehensively including Ujung Kulon National Park (Kurniati *et al.*, 2001) and amphibians in Gede-Pangrango National Park (Liem, 1973). These two national parks are the largest World Heritage Sites close to the Gunung Halimun National Park.

Gunung Halimun National Park is located about 100 km southwest of Jakarta (Figure 1), at altitude between 500-2000 meters above sea level (asl). The large area (total area approximately 40,000 hectares) of sub-mountain forest that covers most of the Gunung Halimun National Park (Niijima, 1997) is an important habitat for amphibians and reptiles with many reptile and amphibian species relying on specific habitats for their survival. This herpetofauna study focused on surveying all major habitats and reporting the habitat preferences and also relative abundance of all species recorded. Findings were based largely on field surveys conducted from September 2001-September 2002 together with specimens and accounts provided by local residents. The main objectives were to consolidate information on the distribution and habitat preferences of amphibians and reptiles and to furnish baseline information that can be used for species richness and population changed indicator in the future.

STUDY AREAAND HABITATS

The study areas are located in ten survey sites (Figure 2), where the altitudes between 700 meters to 1900 meters asl. The study sites elevation of Citalahab, Cikaniki, and Cianten are at elevation of 1000 meters asl; Cibunar, Gunung Wangun, Gunung Bedil and Cigadog are between 700 to 1200 meters asl; Cikeris,

Legok Karang and Gunung Botol are between 1500 to 1900 meters asl. In the ten study sites, seven habitat types were found. Citalahab, Cikaniki and Cigadog consist of rain forest, edificarian and cultivated land; Cianten, Gunung Wangun, Gunung Bedil consist of disturbed forest, secondary vegetation, ruderal and edificarian; whereas Cibunar, Cikeris, Legok Karang and Gunung Botol consist of rain forest and cloud forest. The average daily temperature is 25°C and at night between 15°C to 20°C. Relative humidity averages 70% to 85%. Brief descriptions of the habitats are folio wings:

1. Edificarian: Buildings and other manmade structures of wood, stone, concrete and other materials provide an important habitat especially for some geckos special that are commensally with humans.

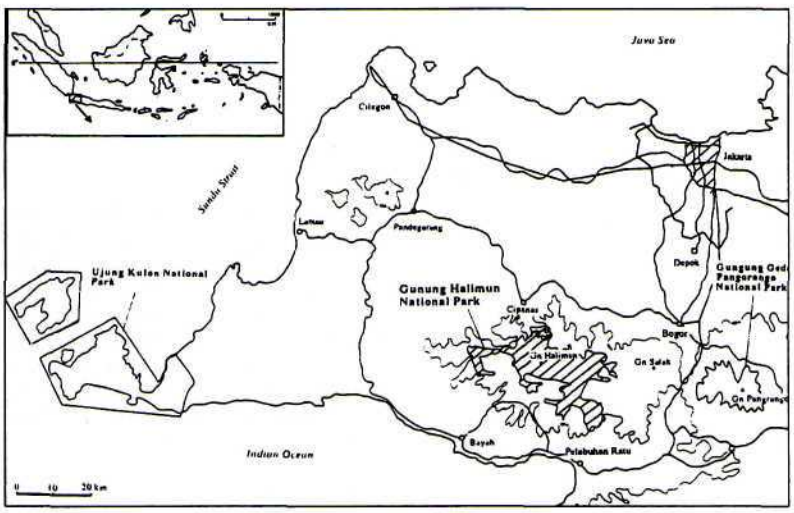

Figure 1. Location of Gunung Halimun National Park.

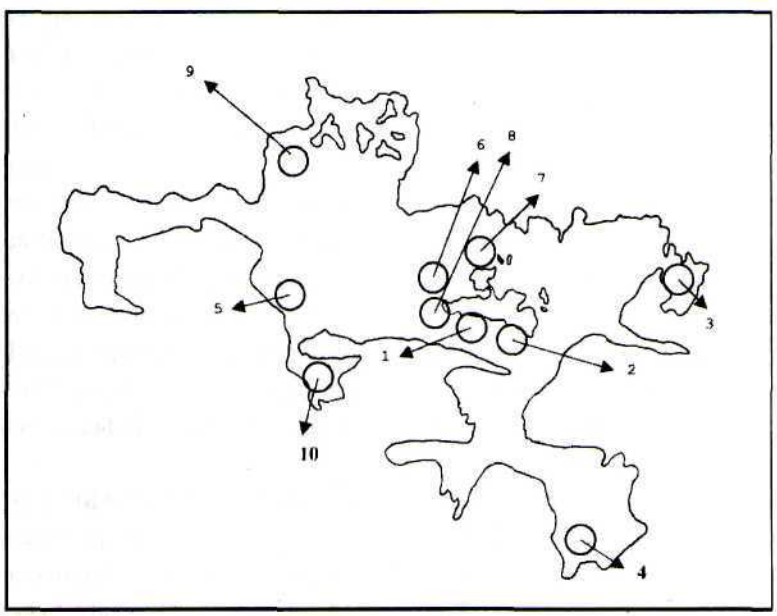

Figure 2. Ten sites of herpetofauna survey in Gunung Halimun National Park. (1) Citalahab; (2) Cikaniki; (3) Cianten; (4) Cigadog; (5) Cibunar; (6) Gunung Botol; (7) Legok Karang; (8) Cikeris; (9) Gunung Wangun; (10) Gunung Bedil.

2. Ruderal: This habitat consists of grassy, weedy areas usually near settlements and adjacent to human habitation, includes roadsides ditch.
3. Cultivated land: This area are dominated by paddy field and tea plantations.
4. Disturbed forest: Disturbed forest occurs frequently at elevation between 700 to 1000 meters asl, where many of native trees have been selectively cut and historically have been cleared or modified by human activity directly or by livestock.
5. Secondary vegetation: This habitat consists mainly of thickets of small trees, shrubs and vines where the forest has been severely disturbed, and most of the mature trees have been removed.
6. Rainforest: This habitat is the most widespread and the most abundant vegetation type on the main area of Gunung Halimun National Park, ranging from 1000 meters to 1500 meters asl. Tree ferns are common in this habitat, especially at the higher elevation.
7. Cloud forest: It is known as moss forest, usually at elevation above 1500 meters asl. Mosses and fern festoon the trunks, limbs and branches of trees and shrubs, and they provide much of the ground cover.

METHODS

Most sites were sampled only once during day or night or both. Counting were made by slowly walking through a selected habitat and recording individual encounters for each species. Voucher specimens were collected whenever possible. Techniques used to collect specimens included:

a. Lighting

This technique uses a powerful flashlight to capture frogs at night. The frogs are temporarily blinded by the bright light in their eyes, making them easy to catch.

b. Hand Collection

This technique is suitable for snakes and lizard by searching in microhabitats including leaf litter, tree bark and buttresses, low-lying vegetation and in or under logs.

c. Trapping

This technique is only useful for small lizards including gekkos (Gekkonidae) and skinks (Scincidae). Small rectangular pieces of wood (20 cm x 30 cm) covered with rat glue were used to trap reptile by placing them in suitable reptile habitats. The capture animals were removed from the traps by using cooking oil.

Relatively little collecting effort was expanded for animals that were easily identified, even at considerable distance. Greater effort was directed toward collecting examples of animals, which were at times difficult to distinguish by sight under field conditions. All collected specimens were deposited in the Museum Zoologicum Bogoriense (MZB), Cibinong, West Java, Indonesia.

For identification, major taxonomy of amphibians followed Inger (1966), Inger and Stuebing (1989); for lizards, gekkos and skinks were based on de Rooij (1915); Ophidia or snakes were based on de Rooij (1917), Tweedie (1983) and Stuebing and Inger (1999); and agamid identifications were based on Musters (1983) and Manthey and Schuster (1996). Major nomenclature of amphibians followed Iskandar and Colijn (2000); lizards and snakes followed Iskandar and Colijn (2001) and Iskandar and Colijn (in print); general gekkonid identifications followed Bauer (1994).

Jaccard's Similarity Coefficient (Krebs 1989) was used to estimate similarities in amphibian and reptile populations between survey sites based on species presence/absence (see Table 1). The following formula was used:

$$Sj.a/a+b+c$$

Where:

S_j = Jaccard's Similarity Coefficient;
a = Number of species in sample A and sample B (joint occurrence);
b = Number of species in sample B but not in sample A;
c = Number of species in sample A but not in sample B.

RESULTS

A total of 25 species of amphibians and 31 species of reptiles were obtained during the survey of ten sampling sites. Results included five families of frog, four families of lizard and four families of snake. A detailed species list is presented in Table 1. The

Table 1. Amphibians and reptiles species list recorded at ten survey sites in Gunung Halimun National Park. Ct=Citalahab; Ck=Cikaniki; Cn=Cianten; Cg=Cigadog; Cb=Cibunar; GB=Gunung Botol; LK=Legok Karang; Ce=Cikeris; GW=Gunung Wangun; GD=Gunung Bedil; (X)=species found; (-)=species not found; (*)=endemic species.

Spesies	Ct	Ck	Cn	Cg	Cb	GB	LK	Ce	GW	GD
Leptobrachium hasselti	X	X	-	-	X	-	X	-	-	-
Megophrys montana	X	X	X	X	X	X	X	X	X	-
Leptophtyne borbonica	X	X	-	-	X	-	-	X	-	-
Leptophryne cruentata *	-	-	-	-	-	-	-	X	-	-
Bufo asper	X	X	X	X	-	-	-	-	X	-
Bufo biporcatus	-	-	X	X	-	-	-	-	X	-
Bufo melanostictus	-	-	X	X	-	-	-	-	X	X
Microhyla achatina *	X	X	X	X	-	-	-	-	X	X
Huia masonii *	X	X	-	X	X	-	-	-	-	-
Rana chalconota	X	X	X	X	-	X	X	-	X	X
Rana erythraea	-	-	-	-	-	-	-	-	X	-
Rana hosii	X	X	-	X	X	-	X	-	-	-
Rana nicobariensis	X	X	X	X	-	X	-	-	X	X
Fejervarya cancrivora	-	-	X	X	-	-	-	-	X	X
Fejervarya limnocharis	X	X	X	X	-	-	-	-	X	X
Limnonectes kuhlii	X	X	-	-	X	-	X	X	-	-
Limnonectes macrodon	X	-	X	X	-	-	-	-	X	X
Limnonectes microdiscus	X	X	-	-	X	X	X	X	-	-
Occidozyga sumatrana	-	-	-	X	-	-	-	-	-	-
Nyctixalus margaritifer *	-	X	-	-	X	-	-	-	-	-
Philautus aurifasciatus	X	X	-	-	X	X	X	X	-	-
Philautus vittiger *	X	-	-	-	-	-	-	-	-	-
Polypedates leucomystax	-	-	X	X	-	-	-	-	-	X
Rhacophorus javanus *	X	X	-	-	X	X	X	X	-	-
Rhacophorus reinwardtii	X	X	X	X	-	-	-	-	-	X
Cyrtodactylus marmoratus	X	X	X	X	X	X	-	X	-	-
Gehyra mutilata	X	X	X	X	-	-	-	-	X	X
Heniydactylus frenatus	X	X	X	X	-	-	-	-	X	X
Draco Jimbriatus hennigi	-	-	-	X	-	-	-	-	-	-
Draco haematopogon	-	-	X	X	-	-	-	-	-	-
Draco v. volans	-	-	X	X	-	-	-	-	-	X
Bronchocela cristatella	-	-	X	X	-	X	-	-	-	-
Bronchocela jubata	X	-	X	X	-	X	-	-	X	X
Gonocephalus chamaeleontinus	-	-	-	X	-	-	-	-	-	-
Gonocephalus kuhlii	X	-	-	-	X	-	-	-	-	-
Pseudocalotes tympanistriga	X	-	-	-	X	X	X	-	-	-
Tachydromus s. sexlineatus	X	-	X	X	-	-	-	-	X	X
Mabuya m. multifasciata	X	X	X	X	X	X	X	X	X	X
Sphenomorphus puncticentralis *	X	-	-	-	-	-	-	-	-	-
Sphenomorphus sanctus	-	-	-	X	-	-	-	-	-	-
Sphenomorphus temmincki	-	-	X	-	-	X	X	-	-	-
Python reticulatus	X	-	X	X	-	-	-	-	-	-
Ahaetulla prasina	X	-	X	X	X	-	-	-	-	-
Aplopeltura boa	X	-	-	-	X	-	-	-	-	-
Calamaria lumbricoidea	-	-	-	-	-	-	-	-	X	-
Calamaria schlegelii	X	-	-	-	-	-	-	X	-	-
Dendrelaphis pictus	X	-	X	X	X	-	-	-	X	-
Liopeltis baliodeirus	X	-	X	-	-	-	-	-	-	-
Liopeltis tricolor	-	-	-	X	-	-	-	-	-	-
Psammodynastes pulverulentus	-	-	-	-	-	-	X	-	-	-
Rhabdophis chrysargos	X	X	-	X	-	-	-	-	-	-
Rhabdophis subminiatus	-	-	-	X	-	-	-	-	-	-
Xenochrophis trianguligerus	X	-	X	X	-	-	-	-	-	-
Xenodermus javanicus	X	-	-	-	-	-	-	-	-	-
Bungarus candidus	-	-	-	X	-	-	-	-	-	X
Trimeresurus puniceus	X	X	-	X	X	-	-	-	-	-
Number of species	36	22	27	36	18	12	12	10	18	16

family Ranidae dominated the frog fauna comprising more than half of the species (11 species; 44.0%). The Rhacophoridae or treefrogs represented by six species (24.0%). The three remaining families, Bufonidae, Megophryidae and Microhylidae were represented by just five species (20.0%), two species (8.0%) and one species (4.0%) respectively. Of the well known species observed, six endemic species were collected, they are *Leptophryne cruentata, Microhyla achatina, Huia masonii, Nyctixalus margaritifer, Philautus vittiger* and *Rhacophorus javanus.*

In lizard group, the family Agamidae included eight species (25.8%), followed by the family Scincidae (4 species; 12.9%), Gekkonidae (3 species; 9.7%) and Lacertidae (1 species; 3.2%). Snake group, the family Colubridae dominated the reptile fauna (12 species; 38.7%), followed hy the family Boidae, Elapidae and Viperidae included one species (3.2%) respectively. All of reptile species observed, only one endemic species was collected, *Spenomorphus puncticentralis*

In Gunung Halimun National Park, amphibians occupied two major macrohabitats: primary forest and disturbed areas. Eight species were virtually restricted to primary forest, these were: *Leptobrachium hasseltii* (restricted to leaf litter), *Leptophryne borbonica, Huia masonii, Rana hosii, Limnonectes microdiscus, Nyctyxalus margaritifer, Philautus aurifasciatus* and *P.vittiger.* Disturbed areas, which included secondary forest, degraded forest, cultivation, human habitation, paddy field and roadside ditches, were inhabited by a variety of species. *Megophrys montana,* a leaf litter specialist, occupied in primary, secondary or degraded forest. Paddy fields are a favorite habitat for several frog species. In Gunung Halimun National Park, five species were fpund very abundant in paddy fields, such as *Microhyla achatina, Rana nicobariensis, Fejervarya cancrivora, F. limnocharis,* and *L. macrodon.* Some species that inhabit paddy fields were found in small numbers, including *R. erythraea* and *Occidozyga sumatrana.* In Gunung Halimun National Park especially in southern part, *F. cancrivora* and *L. macrodon* are regularly collected and sold in the market for human consumption. Because of this activity, these two species were found in low numbers in southern parts of the park. However, in these areas *F. limnocharis* was very abundant, because it occupied the niches of these two species. Two species of frogs, *Rhacophorus javanus* and *R. reinwardii,* were abundant in tea plantations but usually were restricted to peat swamps or permanent pools inside the plantations.

Spenomorphus puncticentralis was the only endemic skink from Java which inhabited in Gunung Halimun. The species was described from one individual that collected from Batu Raden, Central Java, at elevation of 700 meters asl; it was captured on a small tree in an open secondary forest (Iskandar, 1994); however, the skink from Gunung Halimun was captured on forest floor in rain forest at elevation of 1000 meters asl. Possibly, *S. puncticentralis* has widespread distribution. Most of reptiles in Gunung Halimun National Park were numerous in disturbed habitat, including edificarian, ruderal, cultivated land, disturbed forest and secondary vegetation. However, *Gonocephalus kuhlii, Aplopeltura boa* and *Psammodynastes pulverulentus* inhabited mainly in rain forest.

Results of Jaccard's Coefficient Similarity Index calculations are presented in Table 2. The UPGMA diagram of the results show all sites clustered as two big groups (Figure 3). The sites were rain forest covered most of the areas and located at altitude between 1000-1700 meters asl (Citalahab, Cikaniki, Cibunar, Gunung Botol, Legok Karang and Cikeris) clustered as one big group; this group was named as the Forest Group. Another big group, included the sites that disturbed forest covered most of the areas and located at altitude between 700-1000 meters asl (Cianten, Cigadog, Gunung Wangun and Gunung Bedil) clustered as one big group; this group was named as Disturbed Area Group (the areas where the rain forest have been changed by human activities). The Forest Group clustered as two groups; the first group included the sites that rain forest located at altitude between 1000-1300 meters asl (Citalahab, Cikaniki and Cibunar); and the second group included the sites that the rain forest located at altitude between 1300-1700 meters asl (Gunung Botol, Legok Karang and Cikeris). The Disturbed Area Group also clustered

Table 2. Jaccard's similarity coefficient for herpetofauna captured in Gunung Halimun National Park. Ct=Citalahab; Ck=Cikaniki; Cn=Cianten; Cg=Cigadog; Cb=Cibunar; GB=Gunung Botol; LK=Legok Karang; Ce=Cikeris; GW=Gunung Wangun; GD=GunungBedil.

Lokasi	Ct	Ck	Cn	Cg	Cb	GB	LK	Ce	GW	GD
Ct	1,000									
Ck	0,567	1,000								
Cn	0,432	0,386	1,000							
Cg	0,440	0,357	0,658	1,000						
Cb	0,459	0,4S 1	0,100	0,174	1,000					
GB	0,263	0,308	0,258	0,171	0,304	1,000				
LK	0,263	0,360	0,111	0,091	0,428	0,500	1,000			
Ce	0,243	0,333	0,088	0,070	0,400	0,375	0,375	1,000		
GW	0,317	0,290	0,552	0,421	0,091	0,200	0,111	0,0"1	1,001)	
GD	0,268	0,233	0,536	0,444	0,030	0,167	0,077	0,040	0,545	1,000

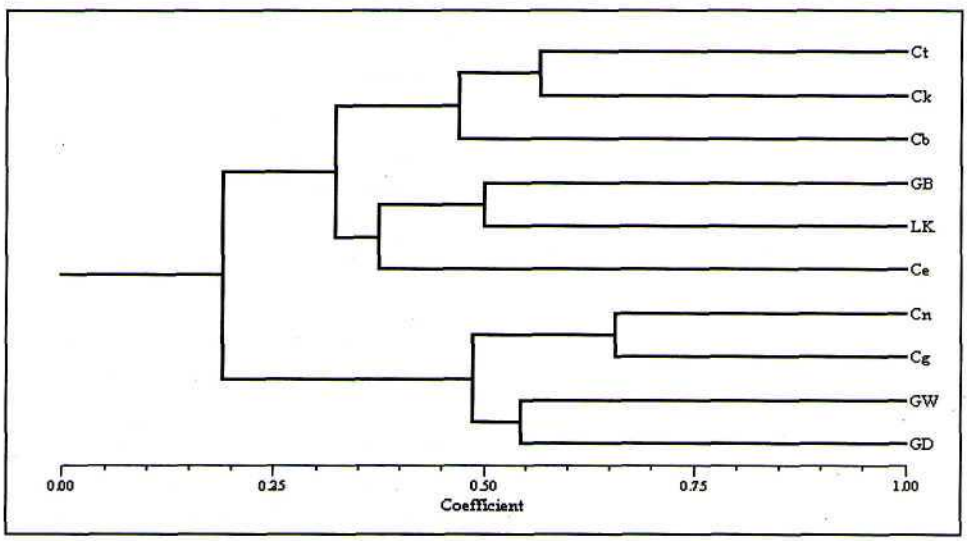

Figure 3. UPGMA diagram based on Jaccard's coefficient indices comparing relative similarities in species richness of herpetofauna at ten sites in Gunung Halimun National Park. Ct=Citalahab; Ck=Cikaniki; Cn=Cianten; Cg=Cigadog; Cb=Cibunar; GB=Gunung Botol; LK=Legok Karang; Ce=Cikeris; GW=Gunung Wangun; GD=GummgBedil.

as two groups; the first group included the sites that the areas located at altitude about 1000 meters asl (Cianten and Cigadog); the second group included the sites that the areas located at altitude between 700-1000 meters asl (Gunung Wangun and Gunung Bedil).

DISCUSSION

Results of these surveys suggest that many of the species observed have a fairly wide ecological tolerance and thus can be found in a range of vegetation types. Following Inger's (1966) altitudinal ranges, the survey sites can be divided into two zones: (1) Moderate: 300 to 1000 meters asl and (2) High: over 1000 meters asl. According to Niijima (1997), sub-mountain forest in Gunung Halimun National Park begins at approximately 1000 meters to 1400 meters asl and mountain forest at altitude between 1500-1800 meters asl. Vegetation types and microhabitat variability appear to affect species richness of amphibians and reptiles in the ten survey sites. The Cilatahab and Cigadog survey sites showed the

highest species richness (36 species), and followed by Cianten (27 species), Cikaniki (22 species), Cibunar and Gunung Wangun (17 species), Gunung Bedil (16 species), Gunung Botol and Legok Karang (12 species) and Cikeris (10 species). Vegetation types in Citalahab and Cigadog consist of sub-mountain rain forest, disturbed forest, secondary vegetation and tea plantations while microhabitat types include edificarian, slow and fast flowing streams, temporary and permanent pools, fallen logs and forest floor leaf litter. Higher numbers of species in Citalahab and Cigadog were found than those in the other survey sites. These were likely associated with a larger number vegetation types and microhabitats found in Citalahab and Cigadog.

Based on general habits and habitats, there are three major groups of frogs in the survey sites following Inger and Stuebing (1989). The first and smallest group consists of species closely associated with man. These species are generally non-forest species and are almost dependent on human disturbance to create preferred environmental conditions: i.e., open spaces, disturbed ground, and standing water. The second group consists of frogs with a fairly broad ecological tolerance; they are classified as forest or non-forest species. None of these species is truly at home in rain forest, although *Rana chalconota* and *Polypedates leucomystax* do well in cultivated land and penetrate the edge of rain forest. The third group and by far most encountered in the survey sites are confined to the rain forest or its edges; these species can be categorized as forest species. More than half of the species identified in Gunung Halimun National Park occupied both in or outside the rain forest (forest and non-forest species; 24 species; 42.8%); 19 species (33.9%) were found only in disturbed habitat (non-forest species); 12 species (21.4%) were found strictly in rain forest (forest species) (see Table 3). These comparisons suggest that most forest and non-forest species have fairly wide ecological tolerance and are found in a range of vegetation types. However, 12 species are primarily forest dweller and 19 species inhabit mostly in open areas. Elevation is one of barrier factors to herpetofauna distribution; species richness of amphibians and reptiles decline with increasing elevation. This is clearly reflected in the similarity index analysis (Table 2) which is the relationship between sites shown in Figure 3. The similarity index showed that closed canopy forest sites at altitude of 1000-1300 meters asl (Citalahab, Cikaniki, Cibunar) clustered as one group, as well as the sites at altitude of 1300-1700 meters asl (Gunung Botol, Legok Karang, Cikeris). Disturbed forest (Ciante, Cigadog) clustered with open forest sites (Gunung Wangun, Gunung Bedil). Sites separated by considerable distance, but with similar ecological characters clustered together most closely, demonstrating that ecological factors primarily influence the distribution of herpetofauna in Gunung Halimun National Park.

Thirty-one species of reptiles were found in Gunung Halimun National Park. The majority or the species found were snakes. This was probably a reflection of high diversity of snake species, most of which were characterized by low population densities and elusive nature.

Most of reptiles in Gunung Halimun National Park were numerous in disturbed habitat, including edificarian, ruderal, cultivated land, disturbed forest and secondary vegetation. However, *Gonocephalus kuhlii*, *Aplopeltura boa* and *Psammodynastes pulverulentus* inhabited mainly in rain forest. Although only few species were restricted in rain forest, many species of reptiles used disturbed habitat as temporary place, since they still needed rain forest for their native habitat. The enormous changes that take place when forest is removed can quickly bring about the demise of species through dessication, lethal temperatures and loss of prey items (Steubing and Inger, 1999).

Amphibians and reptiles play a number of important functions in the ecosystems, such as controlling invertebrate pests and invasive weeds, providing food for other animals and scavenging on dead and injured animals. These processes facilitate the release of nutrients back into the environment (Inger and Stuebing 1989; Liat and Das 1999; Stuebing and Inger 1999).

Table 3. Major frog and reptile habitats in the ten survey sites, Gunung Halimun National Park.

Habitat types		Forest species	Non-forest species	Forest or non-forest species
Aquatic	Terrestrial	**Frogs:** *Leptobrachium hasselti* **Reptiles:** *Psammodynastes pulverulentus*	**Frog:** *Bufo biporcatus* *Bufo melanostictus* **Reptiles:** *Hemidactylus frenatus* *Gehyra mutilata* *Tachydromus sexlineatus* *Calamaria lumbricoidea* *Calamaria schlegelii* *Bungarus candidus*	**Frog:** *Megophrys montana* **Reptiles:** *Cyrtodactylus marmoratus* *Mabuya multifasciata* *Sphenomorphus puncticentralis* *Sphenomorphus temmincki* *Python reticulatus* *Liopeltis baliodeirus* *Liopeltis tricolor* *Rhabdophis subminiatus* *Xenodermus javanus*
	Strong moving water	**Frogs:** *Huia masonii* *Rana hosii*	**Frogs:** *Limnonectes macrodon*	**Frogs:** *Bufo asper*
	Slow moving water	**Frogs:** *Leptophryne borbonica* *Leptophryne cruentata*	**Frogs:** *Fejervarya cancrivora* *Fejervarya limnocharis* *Occidozyga sumatrana*	**Frogs:** *Rana chalconota* *Limnonectes kuhlii* **Reptile:** *Rhabdophis chrysargos* *Xenochrophis trianguligerus*
	Standing water	**Frogs:** *Limnonectes microdiscus*	**Frogs:** *Microhyla achatina* *Rana erythraea* *Rana nicobariensis*	**Frog:** *Rana chalconota*
	Arboreal	**Frogs:** *Nyctixalus margaritifer* *Philautus aurifasciatus* *Philautus vittiger* **Reptiles:** *Gonocephalus kuhlii* *Aplopeltura boa*	**Frogs:** *Polypedates leucomystax* *Rhacophorus reinwardtii* **Reptiles:** *Bronchocela cristatella* *Bronchocela jubata*	**Frog:** *Rhacophorus javanus* **Reptiles:** *Draco fimbriatus hennigi* *Draco haematopogon* *Draco volans volans* *Gonocephalus chamaeleontinus* *Pseudocalotes tympanistriga* *Sphenomorphus sanctus* *Ahaetulla prasina* *Dendrelaphis pictus* *Trimeresurus puniceus*
Number of species		**12**	**19**	**24**

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